REMARKS

Claims 1-18 were considered in the Office Action mailed March 7, 2006.

Claim 5 is objected to due to an informality. The Applicants have amended claim 5 to delete the extraneous words in accordance with the Examiner's helpful suggestion. In addition, claim 1 has been amended to eliminate an idiomatic English issue resulting from translation of the original application.

Claims 1-11 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,388,633 to Mercer, II, *et al.* ("Mercer"), in view of U.S. Patent No. 4,846,402 to Sandell, *et al.* ("Sandell") and further in view of U.S. Patent No. 6,742,568 to Meyer ("Meyer").

Claims 12-16 stand rejected under § 103(a) as unpatentable over Mercer, Sandell and Meyer, in further view of U.S. Patent No. 4,065,299 to Roberts, *et al.* ("Roberts").

Claims 17-18 stand rejected under § 103(a) as unpatentable over Mercer, Sandell and Meyer, in further view of U.S. Patent No. 5,540,077 to Benning, *et al.* ("Benning").

1. The Claims Are Patentable Over Mercer, *Et Al.*

The Applicants respectfully traverse the rejections of claims 1-18 under § 103(a) on the grounds that Mercer and the remaining cited references fail to teach or suggest all of the features of the present invention.

As described in the present Specification, the present invention is directed to a novel approach to maintaining a uniform distribution of a homogeneous

mixture of shielding gas and carrier gas over a melt in a melt furnace for a pressure die-casting machine. The present invention overcomes the problems of the prior art of stratification and inconsistent gas mixture concentrations in the known low pressure gas mixing containers, undesired variations in gas flow between inlet nozzles in a melt furnace and between multiple melt furnaces, and difficulty in controlling gas flow between melt furnaces as gas flow demands change with various plant operations -- all of which, separately or together, are known to result in "concentration shadows," *i.e.*, variations in gas concentration over the melt which can cause insufficient melt metal shielding, accelerated corrosion of melt furnace surfaces, and high pollution emissions. *See,* Specification at ¶¶ [004]-[0007].

The Mercer reference is cited as teaching the claimed shielding gas device, including a container serving as a pressure accumulator provided with a valve 13a, a supply line 13b, a metering device (flowmeter 15) and a device for supplying and adjusting gas supply rate and concentration into a furnace or melting pot 10 through a nozzle 15a. Mercer is acknowledged to not teach the use of a plurality of nozzles and the use of a metering device with a pressure controller; these features are asserted to be taught by Sandell (plurality of nozzles) and Meyer (use of multiple pressure controllers 40). March 7, 2006 Office Action at 2-3.

The Applicants respectfully submit that Mercer does not teach or suggest several features of the present invention recited in claim 1, that these

deficiencies are not cured by the other cited references, and further that there is no suggestion or motivation for the combination of these references.

As acknowledged in the March 7, 2006 Office Action, Mercer does not teach the use of a plurality of inlet nozzles and the use of a metering device including a pressure controller to provide a highly homogeneous gas mixture which is uniformly distributed over the melt. In addition, Mercer fails to teach or suggest the use of a "configured to receive a mixture of individual shielding gas components from a plurality of gas sources"; indeed, this reference contains absolutely no suggestion of any sort regarding homogenous mixing of gases entering the recited container. Mercer instead teaches only the supply of gas from a conventional industrial gas cylinder (tank 13) – a tank which suffers from exactly the sort of problems with inhomogeneous gas mixture layering and gravity settling problems the present invention seeks to avoid. Mercer therefore fails to teach or suggest, and provides no motivation for its combination with another reference, to obtain the present invention's capability for selective mixing of the shielding gas components in a highly homogeneous mixture, or the accompanying ability to adjust a desired gas pressure which maintaining the uniform distribution of the homogeneous gas mixture, depending on the application at hand.

As for the asserted combination of Mercer with Sandell, the Applicants respectfully note that as a first matter, the Sandell spray nozzle is a fundamentally unrelated nozzle design, for which there would be no motivation to apply to a melt furnace for shielding and carrier gas distribution. The Sandell

nozzle is a *slurry* nozzle, designed for distribution of liquids and/or solids in an appropriate environment, and includes two separate feeds, the slurry material and a separate gas feed for atomization of the slurry inside the nozzle before discharge. One of ordinary skill would immediately dismiss the idea of using such a nozzle in a die-casting melt furnace, as there is no need for such a complicated nozzle design and no gas distribution benefits would be achieved.

To the extent that the Sandell reference is being cited solely for its illustrating of more than one nozzle in a slurry tank, the Applicants respectfully submit that one of ordinary skill (of course, having no knowledge of the present invention's approach to providing uniform, stable gas distribution at multiple points in one or more melt furnaces), reading Mercer and Sandell would have only perceived (i) Mercer's one gas inlet fed by a problematic (susceptible to layering, etc.) tank, and (ii) Sandell's three slurry nozzles. Without knowledge of the present invention's approach to providing a previously-unknown level of uniform distribution of a homogeneous gas mixture in a melt furnace with the recited arrangement of nozzles and pressure controllers, one of ordinary skill would have seen no suggestion, or have had any motivation to add additional gas inlets to the Mercer furnace (similarly, the mere disclosure of the use of pressure controllers in Meyer is insufficient to establish a *prima facie* case of obviousness to combine Meyer with Mercer).[1]

[1] The Applicants further note that Meyer also fails to disclose any inlet nozzles and in particular a metering device which would be configured as given by present claim 1. Meyer is not directed to the type of high pressure die-casting machine disclosed in Mercer, but to a low pressure die-casting machine which does not need a protective gas atmosphere and thus contains no teaching provide the same. According to Meyer, the

Thus, in the absence of knowledge of the present invention which permits the mere identification of features in disparate sources to recreate an invention, it would not have been obvious to one of ordinary skill in the art to, on his own, see the possibility of present invention in the disparate Mercer, Sandell and Meyer references. Accordingly, because cited references fail to teach or suggest all the features of the present invention recited in the pending claims, and there would have been no suggestion or motivation for these references' combination in the absence of hindsight knowledge of the present invention, the Applicants respectfully submit that the pending claims are patentable over Mercer, Sandell and Meyer under § 103(a). Reconsideration and withdrawal of the pending § 103(a) rejections is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, the Applicants submit that claims 1-18 are in condition for allowance. Early and favorable consideration and issuance of a Notice of Allowance for these claims is respectfully requested.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

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input gas is exclusively used as a pressure means for driving the ejection of melt from an injector into the mold, which melt transporting function is accomplished by an electromagnetic pump 32 in the Mercer system. It would be plain to one of ordinary skill that a gas input device used to drive the melt transport, as used by Meyer, is not suited for use to provide a protective gas atmosphere as needed in the Mercer system. . Accordingly, a person of ordinary skill would not find it obvious to use the gas delivery unit of Meyer in the arrangement of Mercer.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #028972.56011US).

Respectfully submitted,

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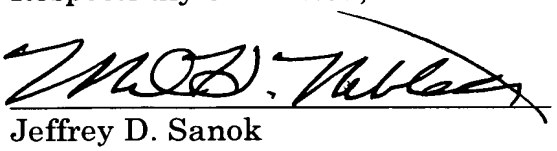

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